

New prostrate species in *Solanum* subg. *Leptostemonum* (Dunal) Bitter (Solanaceae) from eastern Australia

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Summary

Bean, A.R. (2002). New prostrate species in *Solanum* subg. *Leptostemonum* (Dunal) Bitter (Solanaceae) from eastern Australia. *Austrobaileya* 6: 247–252. Two new prostrate *Solanum* species (*S. serpens* and *S. acanthodapis*) are described from subtropical notophyll rainforest near the Queensland-New South Wales border in eastern Australia. Both are stoloniferous, with long trailing stems that frequently root at the nodes. In *Solanum* subg. *Leptostemonum*, this growth habit is thought to be confined to these species and one other taxon.

Keywords: *Solanum*, *Solanum* subg. *Leptostemonum*, Solanaceae, *Solanum serpens*, *Solanum acanthodapis*, Queensland, New South Wales, taxonomy, prostrate, stoloniferous, new species, Australia.

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Introduction

Solanum subg. *Leptostemonum* has several hundred representatives throughout the warmer parts of the world. Members are distinguished by the stellate indumentum, prickly herbage and attenuate anthers (Whalen 1984).

The two new species, together with a third taxon, *Solanum discolor* var. *procumbens* C.T.White (still under study), are apparently unique in the subgenus because of their prostrate habit, with the stems rooting at the nodes at frequent intervals. Numerous other Australian species are small annual herbs that can spread by rhizome, while others are procumbent with stems trailing from a perennial rootstock (e.g. *S. echinatum* R.Br.), but such stems never form roots. In other countries, species are reported to vary from annual herbs to trees (including two Colombian species which attain 20 metres in height; Whalen 1984), but I can find no reference to prostrate stoloniferous members of *Solanum* subg. *Leptostemonum* in any Floras I have examined.

As the prostrate habit is difficult to detect from a herbarium sheet, and because habit is rather variable in some species of *Solanum*, the

taxa treated in this paper have received inadequate attention from botanists in the past.

Bentham (1868) mentioned an unusually broad-leaved and prickly specimen of *S. stelligerum* Sm. from “Cape Byron”, which can probably be attributed to *S. serpens*. White (1944) described *S. stelligerum* var. *procumbens*, for plants he collected from southern Queensland. Symon (1981) reduced this to *S. stelligerum*.

Field studies have shown that *S. stelligerum* var. *procumbens* C.T.White is not closely related to *S. stelligerum*, and is described here at species level, as *S. serpens*. *Solanum serpens* differs from *S. stelligerum* by its broader leaves and stellate hairs with a longer central ray, its andromonoecious inflorescences, and its much larger fruits, yellow-green at maturity and with a much thicker pericarp.

The other prostrate species (named here as *S. acanthodapis*) occurs around Lismore in northern New South Wales.

Solanum serpens and *S. acanthodapis* are both known from several small disjunct populations, widely separated by extensive clearing for grazing, agriculture and

urbanisation. They both exhibit quite a high level of morphological variation between populations (especially in the density of indumentum of the lower leaf surface), although remain remarkably uniform within each population. This variation makes

delimitation of taxa difficult in some areas. They are endemic to the area formerly covered by the Tweed Shield Volcano, centred on the plutonic complex of Mount Warning. Lava flows from this extended as far north as Mt Tamborine and southwards beyond Lismore (Ewart *et al.* 1987).

Taxonomy

Key to prostrate rainforest *Solanum* taxa in eastern Australia

1. Stellate hairs on leaves and branchlets lacking a central ray **S. discolor** var. **procumbens** C.T.White
Stellate hairs on leaves and branchlets with a clearly discernible central ray 2
2. Leaves usually lobed; prickles numerous on both leaf surfaces; ovary and style without stellate hairs; stellate hairs of lower leaf surface with central ray 0.2–1 times as long as laterals **S. acanthodapis**
Leaves entire; prickles absent from lower leaf surface, rare on upper leaf surface; ovary and style with stellate hairs; stellate hairs of lower leaf surface with central ray 3–5 times as long as laterals **S. serpens**

Solanum serpens A.R.Bean **sp. nov.** Frutex prostrates stolonifer; folia integra, aculei sparsi vel nulli in laminae folii, pili stellati radiis centralibus longissimis praediti; inflorescentiae flores bisexualisque masculos ferentes; ovarium pilis stellatis et glandibus stipitatis praeditum; fructus maturitate 14–16 mm diam., chlorini. **Typus:** Queensland. MORETON DISTRICT: Cainbale Creek track, Lamington National Park, 11 December 1999, A.R. Bean 15903 (holo: BRI (1 sheet + spirit); iso: CANB, MEL, NSW).

S. stelligerum var. *procumbens* C.T.White, *Proc. Roy. Soc. Queensland* 55: 72 (1944). **Type:** Queensland. MORETON DISTRICT: Lamington National Park, 27 November 1942, C.T.White 11889 (holo: BRI, 2 sheets).

Solanum sp. (Lamington W.J. McDonald 6176), in Henderson (2002).

Prostrate shrub with long runners, rooting at the nodes, with sporadic erect shoots to 30 cm high. Fertile branchlets terete, grey to rusty, tomentose, with dense (branchlet visible)

stellate hairs, densely armed with prickles (15–35 per dm of branchlet), each 3–6 mm long, glabrous; stellate hairs sessile, 0.25–0.35 mm diameter, lateral rays porrect, 8, central ray 4–9 times as long as laterals. Adult leaves broadly-ovate to elliptical, entire, 5.5–10 cm long, 2.6–4.0 cm wide, 1.4–2.9 times longer than broad, apex acute or obtuse, often basally dimidiate, oblique part 0–3 mm long, obliqueness index 0–4%. Petioles 6–15 mm long, 10–19% length of lamina, prickles present. Upper leaf surface green, prickles often absent, sometimes present on midrib and secondary veins; stellate hairs distributed throughout lamina at least on developing leaves, often confined to major veins on fully expanded leaves, 0.3–0.5 mm diameter, sessile, sparse (>0.5 mm apart), lateral rays porrect, 7–8, central ray 3–6 times as long as laterals. Lower leaf surface white to rusty or greenish, prickles absent; stellate hairs very dense (obscuring leaf surface) or dense (leaf surface not obscured), 0.3–0.4 mm across, sessile, lateral rays porrect, 7–8, central ray of most hairs 3–5 times as long as laterals, some with central ray much shorter. Inflorescences cymose, pseudo-umbellate or with short axis, 1–4 flowered, some flowers functionally male, prickles present or absent on pedicels. Pedicels

11–28 mm long at anthesis. Flowers 5-merous. Calyx densely stellate-hairy, hairs 0.3–0.4 mm diameter, transparent, lateral rays 7–8, central ray 2–5 times as long as laterals. Prickles absent from calyx. Hypanthium campanulate, 1.5–2.5 mm long at anthesis; lobes attenuate, 4–7 mm long at anthesis. Corolla purple, 20–25 mm diameter, lobes 6–10 mm long. Anthers 3.5–5.5 mm long. Filaments 0.6–1 mm long, glabrous. Ovary with stipitate glandular and stellate hairs on distal half, stellate hairs c. 0.5

mm diameter, central ray 2–3 times as long as laterals. Functional style 7.5–8 mm long, erect, with stellate hairs on proximal half, 0.5–0.7 mm diameter, lateral rays 8–9, central ray 1–2 times as long as laterals; stigma entire. Mature fruits 1–2 per inflorescence, globular, 14–16 mm diameter, yellow-green, glabrous, septum absent with placenta confined to central area of fruit; pericarp 0.6–0.8 mm thick when fresh. Pedicels 20–32 mm long. Seeds 3.5–4.0 mm long, pale yellow. Fig. 1.

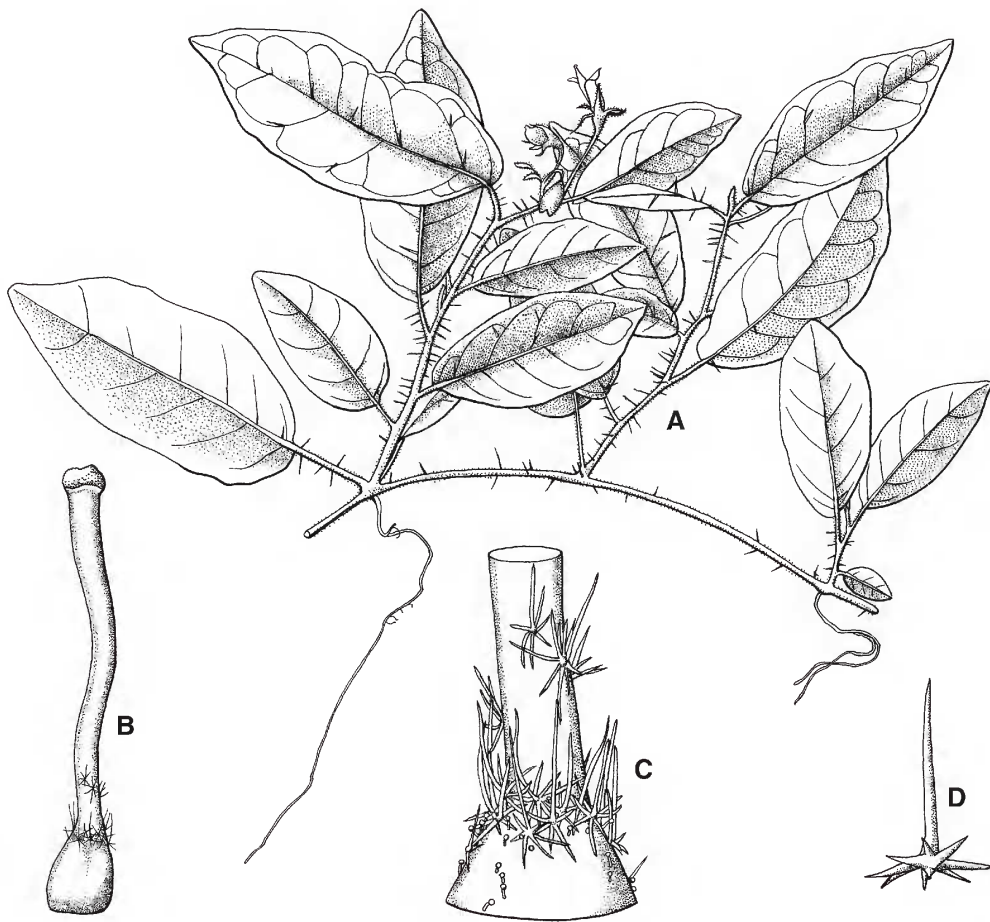
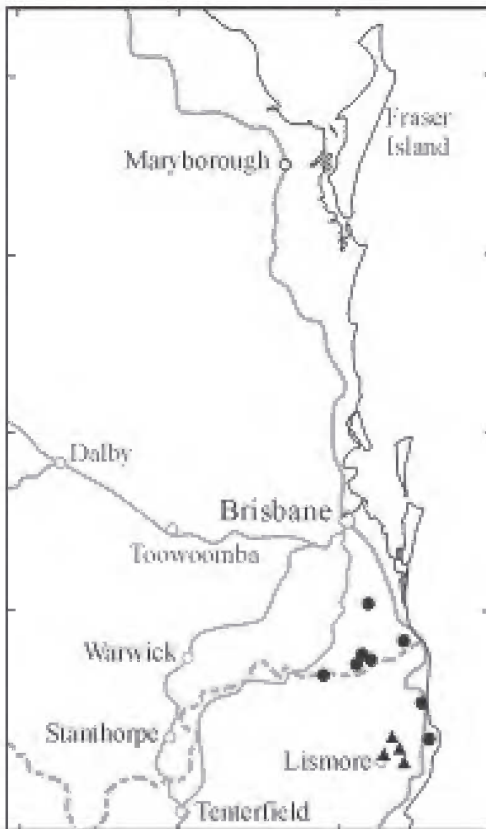


Fig. 1. *Solanum serpens*. A. flowering twigs arising from stolon $\times 0.8$; B. style and ovary $\times 6$; C. upper part of ovary and base of style showing stellate hairs and stipitate glandular hairs $\times 20$; D. a stellate hair from the lower leaf surface $\times 60$. All from *Bean* 15903 (BRI).

Specimens examined: Queensland. MORETON DISTRICT: above Cainbale Creek Falls, Lamington N.P., Jan 2000, *Bean* 15961 (BRI); Romeo Lahey Monument, Lamington N.P., Mar 2000, *Bean* 16133 (BRI, NSW); track to Pat's Bluff, Lamington N.P., Mar 2001, *Bean* 17384 (BRI); Nicholls scrub, c. 6 km SW of Currumbin, Mar 2001, *Bean* 17398 (BRI); Cainbale Ck track, Lamington N.P., Nov 1995, *McDonald* 6176 (BRI); Tamborine Mtn, Easter 1888, *Simmonds* 346 (BRI); Numinbah, Apr 1935, *White* 10232 (BRI); Currumbin scrubs, Sep 1912, *White s.n.* (BRI); Head of Little Nerang R., Jan 1916, *White s.n.* (BRI). **New South Wales.** NORTH COAST: Brunswick Heads Nature Reserve, Oct 2000, *Bean* 16929 (BRI); Brunswick Heads, Jul 1969, *Coveny* 1331 *et al.* (NSW); Three Mile Scrub, near Byron Bay, Nov 1898, *Forsyth* (NSW); Levers Plateau, Apr 1972, *Henderson* H1299 (BRI); Byron Bay, *Maiden & Boorman*, Nov 1903 (NSW).

Distribution and habitat: Distributed sporadically along the McPherson Range, as far west as Levers Plateau, and north to Mt Tamborine, and on lowland sites from Currumbin (Qld) to Byron Bay (N.S.W.) (Map 1). It grows in complex notophyll rainforest, sometimes with Hoop Pine, on fertile loams or clay-loams.



Map 1. Distribution of *Solanum serpens* ● and *S. acanthodapis* ▲.

Phenology: Flowers October to April; fruits March–April.

Affinities: Most closely related to *S. acanthodapis* (see discussion under that species). While it does not appear to be closely related to any other species, it has some affinity to a fairly large group of species that includes *S. furfuraceum* R.Br., *S. tetraethecum* F. Muell. and *S. ellipticum* R.Br.

Notes: The colour and density of indumentum on the lower leaf surface is uniform within populations but can vary between localities. *S. serpens* at the type locality has an extremely dense white tomentum; whereas in specimens from Nicholls Scrub and Byron Bay, the tomentum is rusty and less dense.

Conservation status: Known from about a dozen subpopulations, several of which are on protected land. No conservation status is recommended at present.

Etymology: The specific epithet is from the Latin *serpens*, meaning creeping or snake-like. This refers to the long trailing stems.

***Solanum acanthodapis* A.R.Bean sp. nov.**

Frutex prostratus laete viridis stolonifer; folia lobata; aculei numerosi in lamina; pili stellati radiis brevibus centralibus praediti, inflorescentiae flores bisexualisque masculos ferentes; ovarium glandibus stipitatis praeditum sed pilis stellatis carens; fructus maturitate 15–18 mm diam., chlorini.

Typus: New South Wales. NORTH COAST: Big Scrub flora reserve, c. 20 km N of Lismore, 2 December 2000, *A.R.Bean* 17075 (holo: BRI (1 sheet + spirit); iso: AD, K, L, MEL, NSW).

Prostrate shrub with long runners, rooting at the nodes, with sporadic erect shoots to 30 cm high. Fertile branchlets terete or ridged, pale brown, tomentose, with moderate to dense (branchlet visible) stellate hairs, densely armed with prickles (25–65 per dm of branchlet), each 3–7 mm long, glabrous; stellate hairs sessile, 0.2–0.35 mm diameter, lateral rays porrect, 7 or 8, central ray 0.5–1.5 times as long as laterals. Adult leaves ovate to elliptical in outline, usually with 2–4 pairs of acute lobes,

rarely entire; lobing index 1–1.4; lamina 5.5–9.5 cm long, 2.8–4.5 cm wide, 1.6–2.3 times longer than broad, apex acute, basally dimidiate, oblique part 0–2 mm long, obliqueness index 0–3%. Petioles 10–17 mm long, 14–29% length of lamina, prickles present. Upper leaf surface dark green, prickles numerous (>30) on midrib and secondary veins; stellate hairs confined to major veins even on developing leaves, 0.2–0.3 mm diameter, sessile, lateral rays porrect, 6–8, central ray 0.5–1.2 times as long as laterals. Lower leaf surface pale green to pale yellow, prickles more than 10 on midrib and secondary veins; stellate hairs sparse to very dense, 0.25–0.35 mm across, sessile, lateral rays porrect, 7 or 8, central rays uniform in length, 0.2–0.8 times as long as laterals. Inflorescences cymose, pseudo-umbellate or with short axis, 2–8 flowered, some flowers functionally male, prickles present on pedicels.

Pedicels 9–20 mm long at anthesis. Flowers 5-merous. Calyx moderately stellate-hairy, hairs 0.2–0.3 mm diameter, transparent to purplish, lateral rays 7 or 8, central ray 0.5–1 times as long as laterals. Prickles absent from calyx or a few short (0.5–1 mm long) prickles present. Hypanthium campanulate, 2–3 mm long at anthesis; lobes attenuate, 1.5–2.5 mm long at anthesis. Corolla mauve to purple, 15–20 mm diameter; lobes 5–7 mm long. Anthers 4.0–5.0 mm long. Filaments 0.6–1 mm long, glabrous. Ovary with stipitate glandular hairs on distal half. Functional style 6–7.5 mm long, erect, with stipitate glandular hairs at base; stigma entire. Mature fruits 1 per inflorescence, globular to ellipsoidal, 15–18 mm diameter, yellow-green, glabrous, septum incomplete with placenta confined to central area of fruit; pericarp c. 0.8 mm thick when fresh. Pedicels 21–24 mm long. Seeds 3.5–4.0 mm long, pale yellow. Fig. 2.

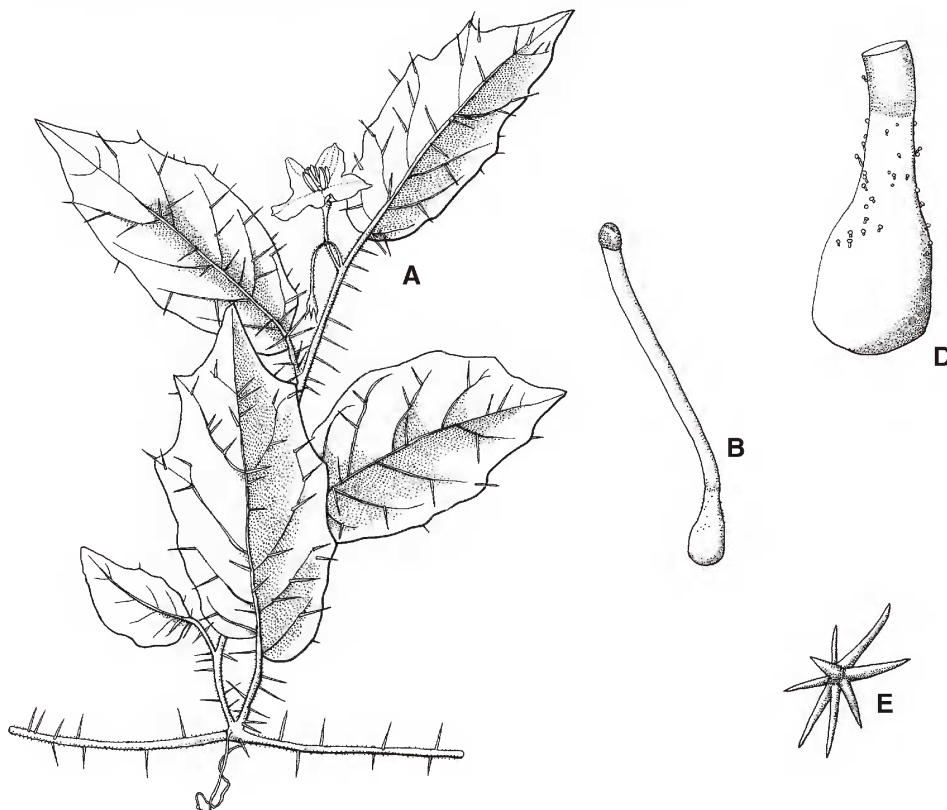


Fig. 2. *Solanum acanthodapis*. A. erect flowering shoot arising from stolon $\times 0.8$; B. style and ovary $\times 6$; C. ovary and base of style showing stipitate glandular hairs $\times 20$; D. a stellate hair from the lower leaf surface $\times 60$. All from *Bean* 17075 (BRI).

Specimens examined: New South Wales. NORTH COAST: Victoria Park Nature Reserve, c. 8 km S of Alstonville, Apr 2001, *Bean* 17564 (AD, BRI, MEL, NSW); Victoria Park, 4 miles [6km] SSW of Alstonville, Aug 1969, *Clark* 1260 *et al.* (BRI, NSW); Big Scrub Flora Reserve, Apr 2001, *Bean* 17561 (BRI, NSW); Rotary Park, Lismore, Dec 2000, *Bean* 17081 (BRI); Booyong Flora Reserve, ENE of Lismore, Dec 2000, *Bean* 17083 (BRI).

Distribution and habitat: Of restricted distribution in far north-eastern New South Wales, from Whian Whian S.F. in the north to near Alstonville in the south (Map 1). It grows in low-altitude complex notophyll rainforest usually on basaltic clay-loams, but also on meta-sediments.

Phenology: Flowers August-February; fruits March-April.

Affinities: *S. acanthodapis* differs from *S. serpens* by: stellate hairs (on all parts) with short central rays (*versus* very long central ray for *serpens*); upper leaf surface (excluding veins) glabrous even on developing leaves; lateral veins somewhat raised on upper leaf surface; ovary glabrous or with stipitate glandular hairs only (*versus* stipitate glandular hairs & stellate hairs for *S. serpens*).

Conservation Status: *S. acanthodapis* is known from only four locations, with a total population certainly less than 10,000 individuals (and probably less than 1,000 individuals). Applying the IUCN Criteria (Anon. 2001), a conservation status of "Vulnerable" is recommended (Criterion C (2a)). It is threatened by weeds, clearing of its habitat and destruction by humans.

Etymology: From the Greek *acanthos*- prickly and *dapis*- a carpet or rug, alluding to the habit of the plant. Well-developed plants resemble a prickly green carpet.

Note: A collection from the property of Mr. B. Walker, southern outskirts of Nimbin (*Bean* 16948 (BRI, MEL, NSW)) is morphologically intermediate between *S. serpens* and *S. acanthodapis*.

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